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PORT on a UNION

# MOTOR TRUCK TERMINAL

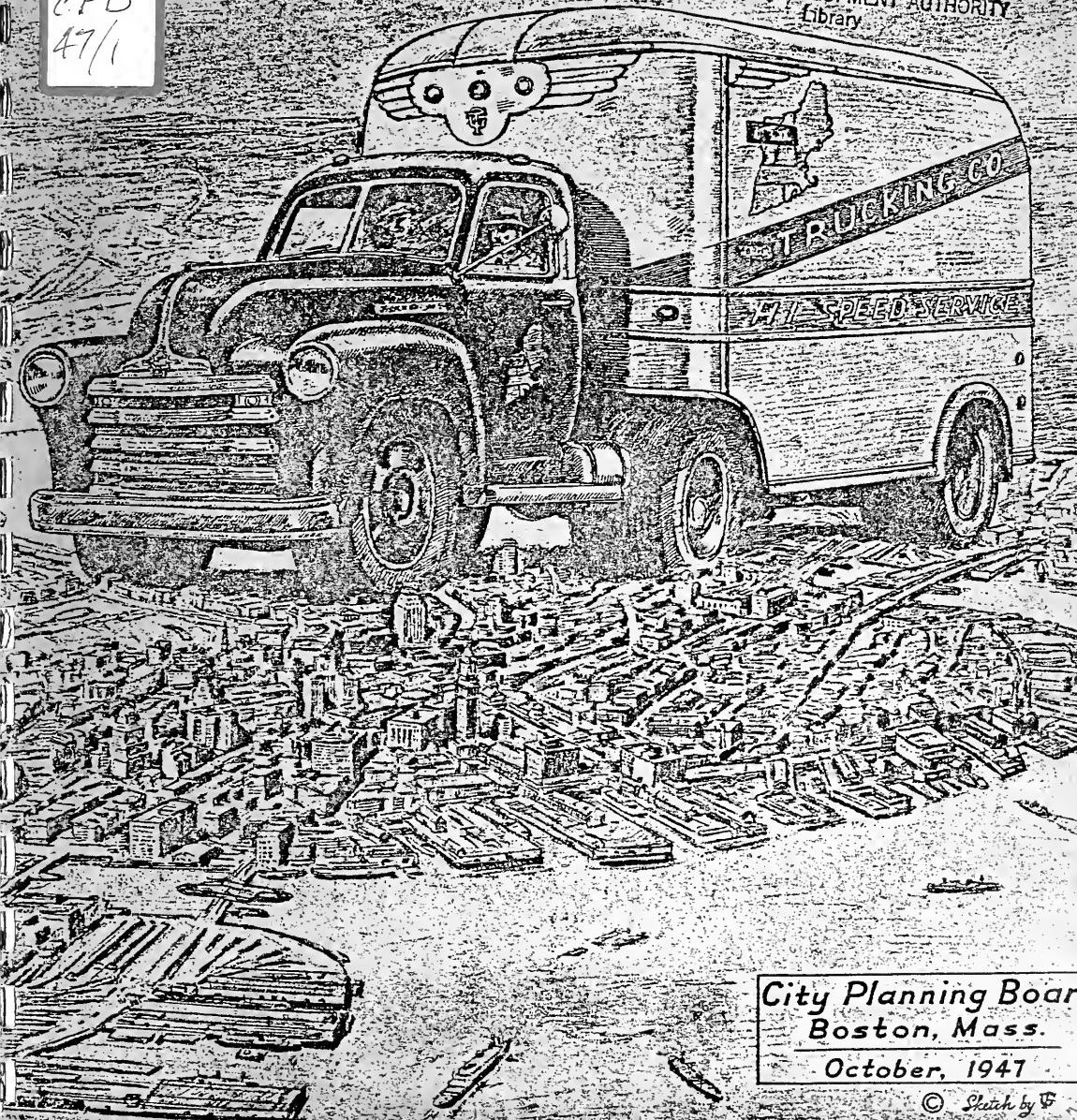
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City Planning Board  
Boston, Mass.

October, 1947

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Boston, Mass.

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Joseph F. Kord, William Filene's Sons





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EXCESSIVE TRUCKING SERIOUSLY COMPLICATES  
THE DOWNTOWN TRAFFIC PICTURE



THOMAS E. McCORMICK  
EXECUTIVE DIRECTOR

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SECRETARY

OFFICE OF  
**THE CITY PLANNING BOARD**  
43 City Hall  
BOSTON 8, MASS.

October 10, 1947

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Hon. John B. Hynes  
Temporary Mayor of Boston

Dear Mayor Hynes:

The City Planning Board submits herewith its "Report On A Union Motor Truck Terminal For Boston". This report is the culmination of nearly a year's time devoted intermittently to the careful research necessary to a proper understanding of the subject. The work was begun at the direction of His Honor, Mayor James M. Curley, who, in turn, was acting at the request of the City Council, made on September 9, 1946 by passage of the following order:

"That His Honor, the Mayor, request the City Planning Board, the Corporation Counsel and any other city departments to survey, plan and prepare legislation to be presented to the 1947 session of the Massachusetts Legislature in regards to the following matters: In order to diminish or eliminate the traffic congestion and to speed up the flow of traffic in the City of Boston, it is suggested that:  
 1. a truck terminal be located in the City of Boston.  
 2. make out a list of streets in the City of Boston to be widened and request that the work be financed out of the State Highway Fund. 3. arterial highway for the City of Boston to be financed out of the State Highway Fund."

The amount of work involved in a competent development of truck terminal legislation precluded any possibility of its being ready for the 1947 session of the General Court.

The Board acknowledges with gratitude the ad-

vice and assistance freely given by the following, who have comprised an advisory committee in making the studies necessary for this report:

Mr.. William H. Day, Chairman, representing the Boston Chamber of Commerce, Transportation Department,

Mr. Myles Illingsworth, Massachusetts Motor Truck Association,

Mr. Ronald S. Woodberry, New England Motor Rate Bureau,

Mr. Edward J. Sampson, Boston Express Exchange,

Mr. Ellerton J. Brehaut, Boston Chamber of Commerce, Civic Department,

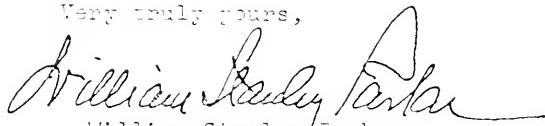
Mr. Eldon Richardson, Traffic Manager, Lever Brothers Company, and

Mr. Joseph F. Kord, Operation Superintendent, William Filene's Sons.

Valuable assistance was also rendered by Mr. Frank Dickson, motor rate analyst and Vice-President of H. B. Church Company, Mr. Philip T. Desmond, Chief Traffic Engineer of the Boston Traffic Commission, the Massachusetts Department of Public Utilities, and the many trucking firms who answered the questionnaire sent to them.

The Planning Board hopes that this report and the bill contained herein will lead to early legislation authorizing the construction of one or more terminals in Boston.

Very truly yours,

  
William Stanley Parker  
Chairman

# GENERAL CONCLUSIONS of the REPORT



After a thorough analysis of the best available information, the City Planning Board believes that:

1. Downtown Boston's traffic, now becoming critical, is aggravated in no small measure by the inefficiency of present methods of truck operation in pickup and delivery work. The inherent waste in these methods is indicated by the fact that the pickup and delivery trucks are carrying, on the average, only 44% of their capacity.

2. As generally agreed by traffic authorities, modern union truck terminals, serving as central points of consolidation and clearance of freight, constitute the most effective answer to the urban trucking problem. Such terminals provide two general types of benefits: traffic relief and lower operating costs.

3. At present at least 2,000 trucks belonging to common carriers are actively engaged each day in pickup and delivery in downtown Boston. In handling 7,200 tons daily of less-than-truckload freight in consignments of 3 tons or less, these trucks generate about 30,000 truck-miles on downtown streets. This is the kind of trucking activity which could be most beneficially handled through a union terminal.

4. An initial plan for Boston should envision the building of one or two terminals close to the downtown area. A daily volume of 2,800 tons handled at the platform might reasonably be expected. This should result in a reduction of one-eighth in the total volume of truck traffic occasioned by pickup and delivery, and savings of approximately 27 cents per ton on

the handling of freight, 51 cents per ton on pickup and delivery; total annual saving about \$800,000.

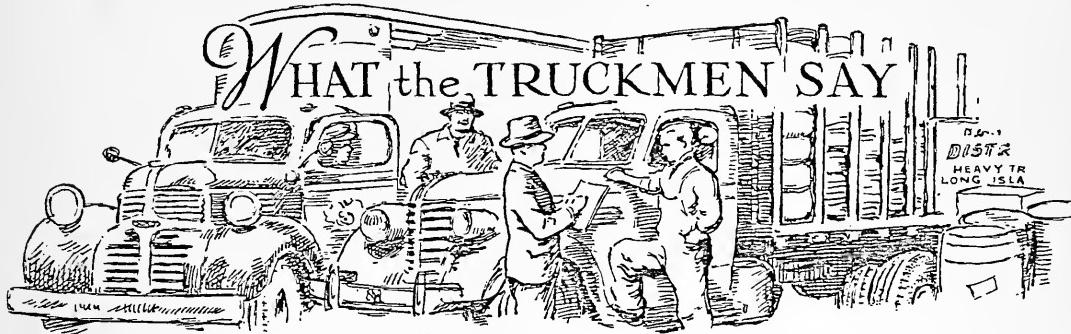
5. If two terminals are planned, one should be to the immediate north, one to the immediate south of the downtown area. Sites totalling at least 9 acres would be required and, all told, the terminals should have back-up spaces for at least 200 trucks and cost about \$2,500,000.

6. An agency of the city government, in the form of a commission appointed by the Mayor, should be created to build and operate such terminals, financing its ventures through serial bonds backed by the credit of the City.



Fig. 1

Trucking Confusion In The Market  
Courtesy, The Boston Herald



Quotations From The Remarks Of Truckmen Who Answered Questionnaire

"We have had talk for a great many years about a project of this kind. What we need is serious planning and determined action to relieve what is not only now a serious condition but which will become an impossible one. The cost should be of secondary consideration as it will be returned many times to every individual and business house."

\_\_\_\_\_ Company, Boston, Mass.

"Most of our delays are due to touring cars and parking of people employed in Boston. Delays by blocking of streets, and unloading of trailers and large trucks."

\_\_\_\_\_ , Boston, Mass.

"The building of truck terminals are important, but the proposed ban of trucks would be disastrous to the business of the city."

\_\_\_\_\_ Dispatch, Boston, Mass.

"I am 100% in favor of your plan."

\_\_\_\_\_ Motor Express, Ayer, Mass.

"A terminal located between North and South Stations on a wharf along Atlantic Avenue or Commercial Street would improve present conditions."

\_\_\_\_\_ Express, West Medway, Mass.

"I am in favor of one large terminal in Boston where everyone can get their calls and make transfer of freight. This terminal should be in a place where it will not tie up traffic."

\_\_\_\_\_ Express, Hyde Park, Mass.

"I heartily endorse this investigation and hope it produces tangible results in the near future. From my own experience I can see that many trucking companies need platform and terminal space in Boston."

\_\_\_\_\_ Express, Athol, Mass.

"Our suggestion is to keep all cars from parking in downtown Boston which are 90% unnecessary and let the trucks do their work. Certainly that is necessary and the cars are not necessary. Freight must be delivered and you can't get away from that whether delivered in a small truck or a large truck."

\_\_\_\_\_ Bros., Inc., Fitchburg, Mass.

"If we had one large truck terminal to handle all business through, instead of nine general express offices it would relieve a great deal of congestion from the streets. As it is now, the only place to park is in the street while picking up or delivering at an express office. A good truck terminal with space around it would eliminate this fault."

\_\_\_\_\_ Transportation Co., Brockton, Mass.

"I would suggest....some large terminals strategically located....we must establish Mid-west and transcontinental connections by truck with Boston terminals....so that people outside will make more purchases, ship more ocean, rail, and truck freight to and from Boston than ever before."

\_\_\_\_\_ Motor Express, Rowley, Mass.

"We operate from 3 General Express Offices in Boston and would appreciate 1 good big terminal with plenty of yard space. We believe such a terminal should have enough land to get the trucks off the highway if it is to be successful."

\_\_\_\_\_ Express, Inc., Milford, Mass.

"Eliminate semi-trailers from delivering or picking up merchandise under 3,000 lbs. or 343 sq. ft. by volume."

\_\_\_\_\_ Express, Waltham, Mass.

"More than just a motor truck terminal is needed....my idea is to keep parked cars away from the streets and then the trucks would not be keeping the streets blocked by double parking."

\_\_\_\_\_  
Motor Transportation Co., So. Boston, Mass.

"I believe in delivering all small deliveries and making all small pick-ups with small pick-up trucks. Large pick-ups and deliveries should be made with large units in downtown Boston only. I find this speeds up the operation immensely and helps traffic."

\_\_\_\_\_  
Transportation Co., Boston, Mass.

"The plan which I believe should be given immediate consideration is this: Eliminate all traffic except trucks and taxicabs from the area bounded by Congress St. to Milk to Federal to High to South to Kneeland to Tremont to Brattle to Dock Sq., .... between the hours of 9 A.M. and 5 P.M. Why not see what a 30-day period would show and if satisfactory make it permanent? There are many congested areas in Boston, but 'downtown' seems to warrant first effort."

\_\_\_\_\_  
Despatch and Warehouse Co., Charlestown, Mass.

"In the event that your study indicates the need for such a terminal, it seems to me that land in the vicinity of Southampton Street would be the proper spot for this facility. This location would serve the numerous 'over-the-road' trailers operating between Boston and New York. There is an extremely heavy truck tonnage moving in this service and many of these heavy units now travel through Boston proper en route to and from truck terminals located in Cambridge and Somerville."

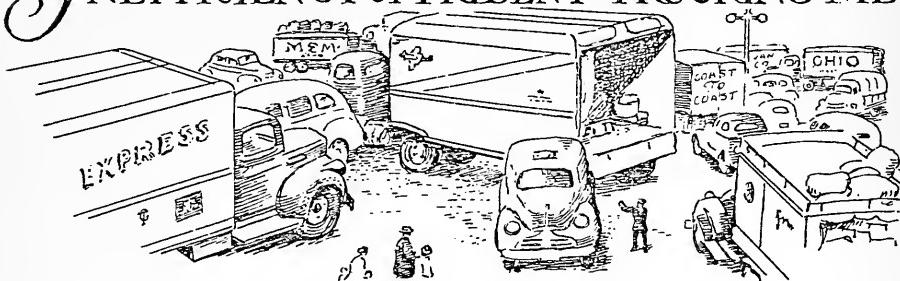
\_\_\_\_\_  
Company, South Boston, Mass.



Fig. 2

The Unenviable Plight Of The Truckman  
Courtesy, The Boston Herald

# INEFFICIENCY of PRESENT TRUCKING METHODS



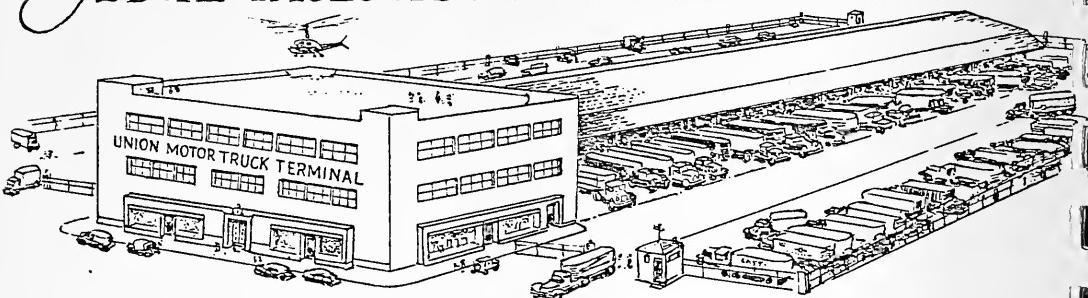
The movement of goods is to the city what the circulation of blood is to the body, a vital function which must be maintained at a high level of efficiency. During the past few decades the motor truck has been transformed from a state of crudity to a dependable, versatile vehicle which, being capable of incomparably greater flexibility of use, has not only supplanted the horse-drawn cart in short-haul work but has become the serious competitor of the railroads and coast-wise shipping. The full possibilities of the motor truck cannot be secured without good highways and terminal facilities. Great progress has been made in the building of highways, whereas the construction of modern truck terminals has been almost totally neglected.

Motor truck freight has many origins and many destinations and, unlike railroad freight, is moved by many competing carriers. In many instances, and especially in intra-urban short-haul work, this freight, consisting largely of small consignments of 6,000 lbs. or less, is carted directly from origin to destination. A roughly analogous situation would exist if our postal

service should attempt to deliver all mail directly from the points at which it was posted to the points of destination. So inefficient are the present methods of moving freight by truck that the New England Motor Rate Bureau has estimated that the load factor on pickup and delivery work in the Boston area is only 44%, that is to say that, on the average, trucks engaged in that work are loaded to only 44% of capacity.

Small load factors are only one result of present trucking methods, which are distinguished by many kinds of waste. Partially loaded trucks, doing many more miles than are necessary, follow each other over the streets of the city from the doors of shippers to consignees, aggravating an already bad traffic problem, adding to the cost of doing business. Huge semi-trailers, arriving at a downtown destination after a long haul, block off a whole street while their partial cargoes are being unloaded, presenting the spectacle of expensive equipment being used to do work which might be done by lighter vehicles. Freight interchanged between carriers for forwarding purposes must be loaded onto trucks and transported over the streets intervening between the respective places of business of the truckmen involved. Shippers are plagued by a multitude of trucks calling to pick up freight which it would be physically possible to move with very few vehicles. One Boston businessman has told of seventeen trucks calling on a single day to pick up what could have been shipped by two trucks. The solution to the problem, as obvious as the central post office, is a central point of consolidation and clearance for freight, a union motor truck terminal.

# ADVANTAGES of MODERN UNION TERMINALS.



Of course, the advantages of consolidating freight in pickup and delivery operations have long been apparent to progressive truckmen and the larger of the long-haul carriers now have private terminals which they own or lease. In some instances several carriers share the same facilities, as tenants. In downtown Boston a single company operates nine small express exchange offices, providing many of the smaller truckmen with services similar to those which would be provided by a union terminal. A map showing locations of general express offices and private terminals within five miles of the State House is shown as Fig. 3. These private facilities, while making possible a consolidation of loads on a limited scale, and though better than nothing at all, yet do not measure up to modern requirements. Other cities, faced with the same problem, are giving serious consideration to the construction of large union terminals, either as public projects, or by private enterprise with public assistance. In New York City the Port Authority has begun construction of a \$5,000,000 terminal in Manhattan, capable of handling 2,000 tons of freight a day and equipped with the most modern devices.

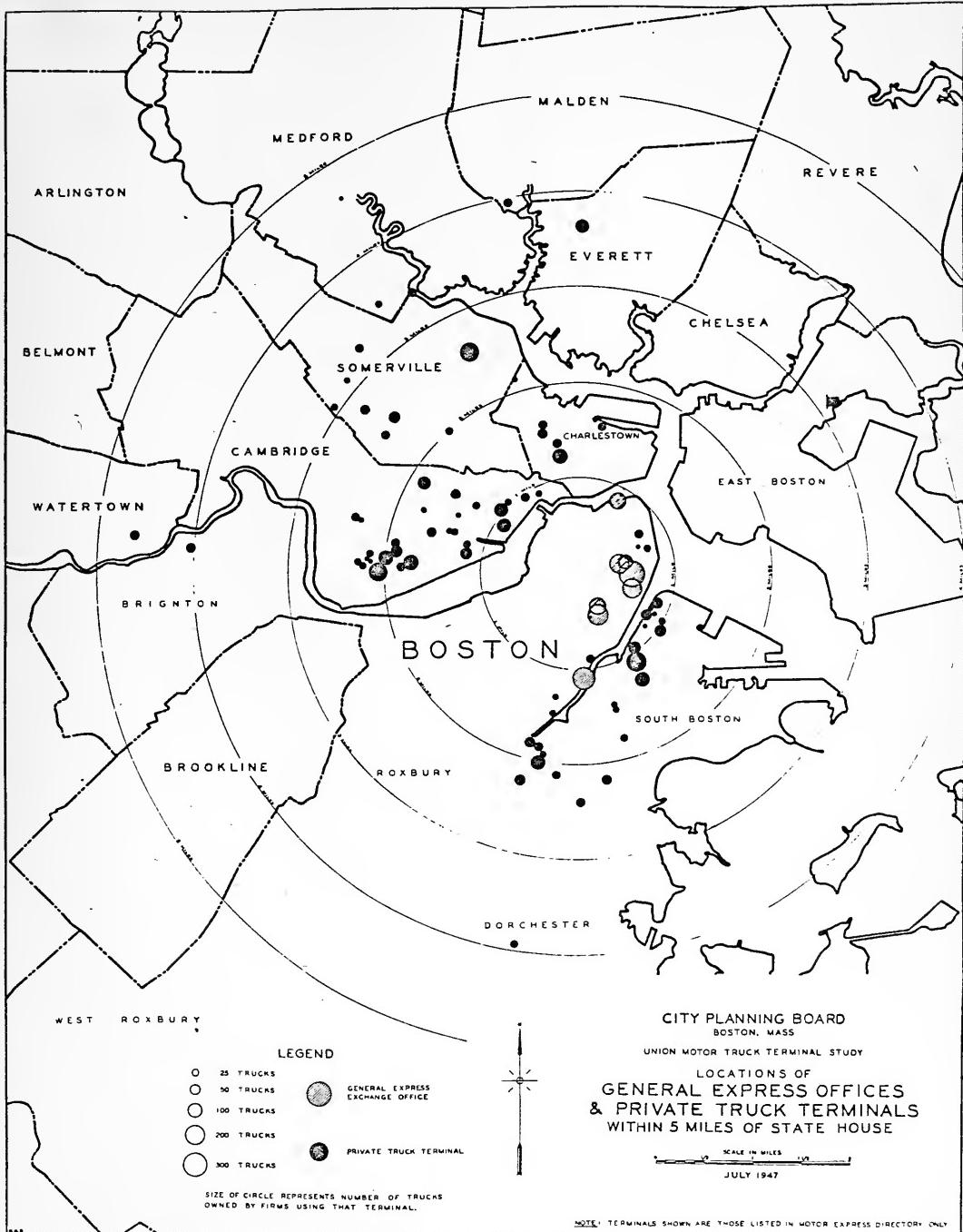


Fig. 3

The chief purpose of a union terminal is to serve as a central point of consolidation and clearance for less-than-truckload (L.T.L.) freight to be picked up or delivered in the area served by the terminal. This area is divided into zones. Pickup and delivery work in each zone is handled by one or more local carriers under contract with the Terminal Company and its tenant carriers, who are mostly of the long-haul, over-the-road type. All freight arriving at the terminal is unloaded at the platform, sorted and consolidated according to destination, whether local or long distance. This results in full truck loads on pickup and delivery and elimination of the present excessive route mileage, since each truck confines its activities to a relatively small area. It results also in substantial savings in the handling of freight at the platform since large volumes justify the installation of labor-saving equipment and all hands are kept busy by a constant flow of goods. In a union terminal freight interchanged between carriers need move only along the platform, instead of over the streets as at present. Of and by itself a modern union terminal constitutes a traffic improvement, since all of its operations are conducted off the street.

# SURVEYING the PROBLEM in BOSTON



It is plain, then, that there are two general types of benefits from a union terminal, namely, traffic relief and lower costs. The first is a direct benefit to the community as a whole; the second accrues directly to the truckmen and shippers and indirectly to the public. The problem which we face is one of determining whether a terminal should be built and by whom, of what size, in what location, and how and by whom operated. These determinations depend upon the character and extent of the estimated benefits. The first step, therefore, is to find out how great a reduction in truck traffic and how large a saving in trucking costs would be achieved by a terminal. These are relatively simple calculations derived from such basic data as number of tons of L.T.L. freight now picked up and delivered in Boston, number of trucks involved, average daily mileage, present unit costs for pickup and delivery and handling, load factors, etc. The Planning Board has been fortunate in securing the willing cooperation of truckmen and transportation specialists, who alone can make this fundamental information accessible.

City Planning Board  
Room 43, City Hall  
Boston 8, Mass.

Questionnaire for Study of Motor Truck Terminal  
Submitted by City Planning Board

The answers to all questions should relate to  
an average day and to freight consisting of consignments  
of 6,000 lbs. or less.

1. How many of your own trucks are engaged in pickup  
and/or delivery work in downtown Boston, on an average  
day? \_\_\_\_\_

Answer

2. How many trucks belonging to others call at your  
terminal on pickup and/or delivery work in downtown Bos-  
ton, on an average day? \_\_\_\_\_

3. How many stops for pickup and/or delivery do the  
trucks referred to in (1) make in downtown Boston on an  
average day? Give answer as an average per truck. \_\_\_\_\_

4. How many tons of freight in consignments of 6,000  
lbs. or less do the trucks referred to in (1) pick up  
and/or deliver in downtown Boston, on an average day? \_\_\_\_\_

5. How many tons of freight in consignments of 6,000  
lbs. or less do you forward to terminals or places of  
business of other carriers in the Boston area, for trans-  
shipment, on an average day? \_\_\_\_\_

Remarks:

---

---

---

Company or Firm \_\_\_\_\_

Address \_\_\_\_\_

Person Reporting \_\_\_\_\_

Date \_\_\_\_\_

It has been assumed that a first union terminal would be intended primarily for downtown Boston. It is understood, of course, that the problem is ultimately one which is regional in scope, but the principal need is for a terminal which will provide relief for downtown Boston. Hence, a survey of present trucking volume has been restricted to mixed general freight in consignments of 6,000 lbs. or less, picked up or delivered in the downtown area by common carriers. This is the kind of trucking activity for which a union terminal is intended.

The principal sources of information have been:

1. The files of the Massachusetts Department of Public Utilities which have given a complete inventory of trucks and tonnage capacities. Through a selective process this information has been formed into a base to which sample data, obtained by questionnaires, has been applied.
2. Questionnaires, the form of which is shown in Fig. 4 sent to 430 representative trucking firms. These have been the source of sample information of a vital character relative to the number of tons of freight involved in downtown trucking operations.
3. The New England Motor Rate Bureau, which has made available complete and detailed unit costs of conducting trucking operations by present methods. These figures are the result of continuous research over a long period, covering thousands of individual cases.

Though the amount of information gathered has been ponderous, the analysis and calculations have been relatively simple and have indicated that:

There are at least 550 firms\*, large and small, who are engaged daily as common carriers in pickup and delivery of small consignments in downtown Boston.

At least 2,000 trucks are involved in such pickup and delivery, on an average day.

\*See Appendix II for a detailed description of these firms.

As a measure of traffic volume, these trucks generate about 30,000 truck miles daily on downtown streets.

Approximately 7,200 tons of freight in small consignments are picked up or delivered daily in the downtown area by these trucks.

About 2,300 tons of freight are interchanged daily between common carriers in the Boston area.

Average cost, at present, of pickup and delivery is \$2.44 per ton; of handling freight at terminal platforms is \$1.74 per ton.

These are the facts which give the measure of the present trucking conditions in Boston.

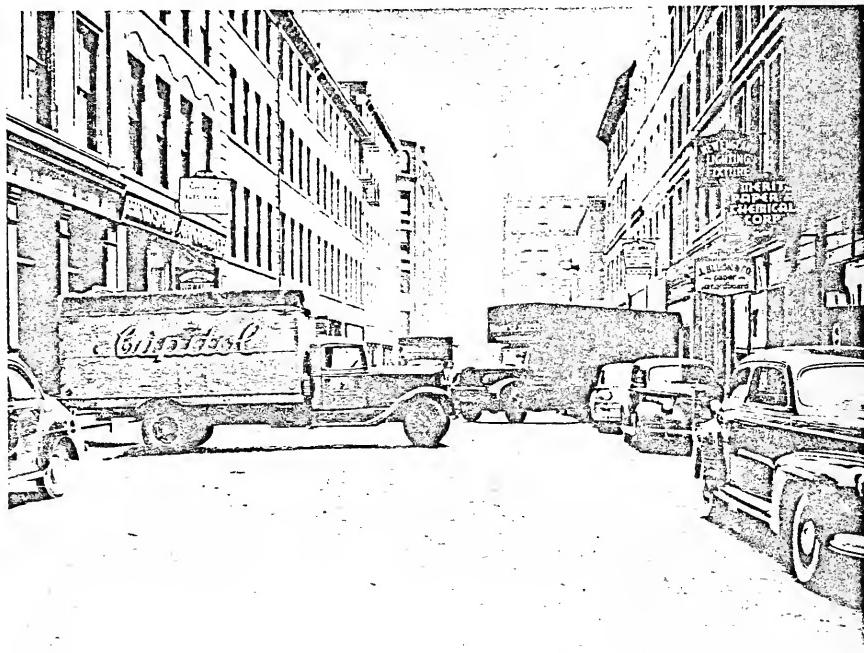
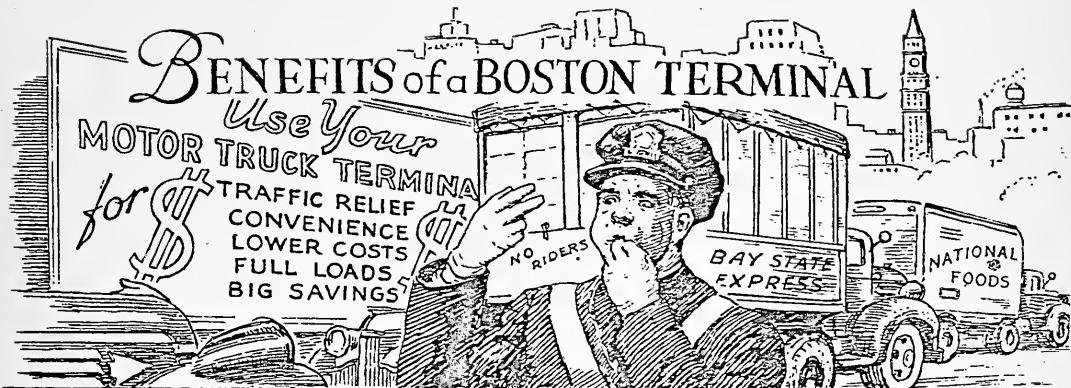


Fig. 5

Typical Of Trucking Conditions In Boston,  
A Union Terminal Would Do Much To Eliminate This  
Courtesy, The Boston Herald



A conservative estimate of the volume of freight which might logically pass through a Boston union terminal is 2,800 tons daily. of which 2,400 tons would be picked up or delivered in the area served by the terminal, and 400 tons interchanged between carriers at the platform, to be forwarded to points beyond Boston. Assuming that the present load factor of 44% can be doubled, a terminal of the size just specified would make possible:

A reduction of one-eighth in all truck traffic occasioned by pickup and delivery of small consignments in downtown Boston.

A reduction of 50% in the amount of truck traffic for each ton actually picked up or delivered.

A saving of 27 cents on each ton of freight handled at the platform.

A saving of 51 cents on each ton of freight picked up or delivered.

A gross annual saving to truckmen, shippers, and eventually to the public, of approximately \$800,000.

These estimates represent a measure of the direct benefits only, and they are for a terminal large enough to handle

little more than one third of all the freight. No measure, in monetary terms, of the advantages in time saved, convenience, increased efficiency at shippers' doors, etc., is possible, but of their significance in improving the competitive commercial position of Boston there can be little doubt.

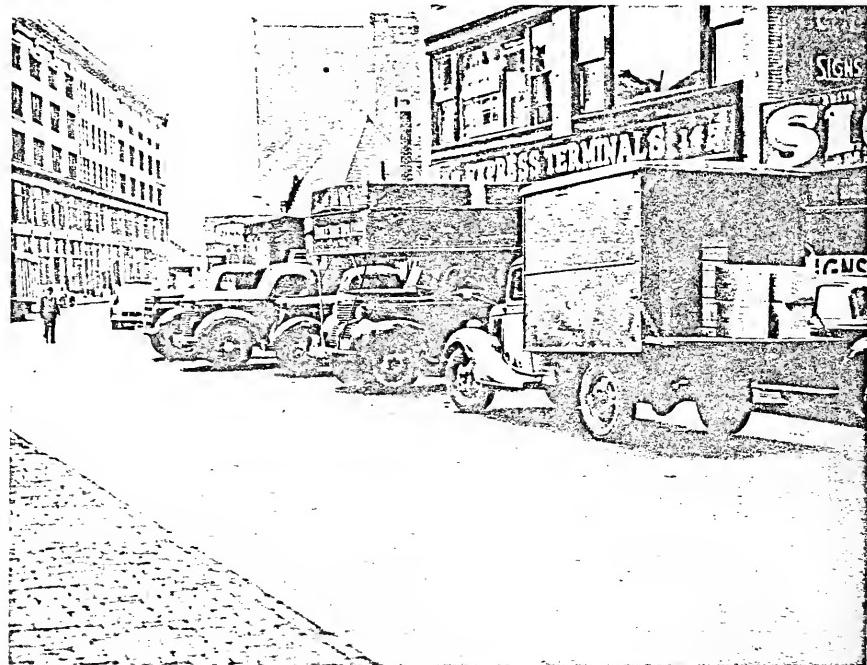
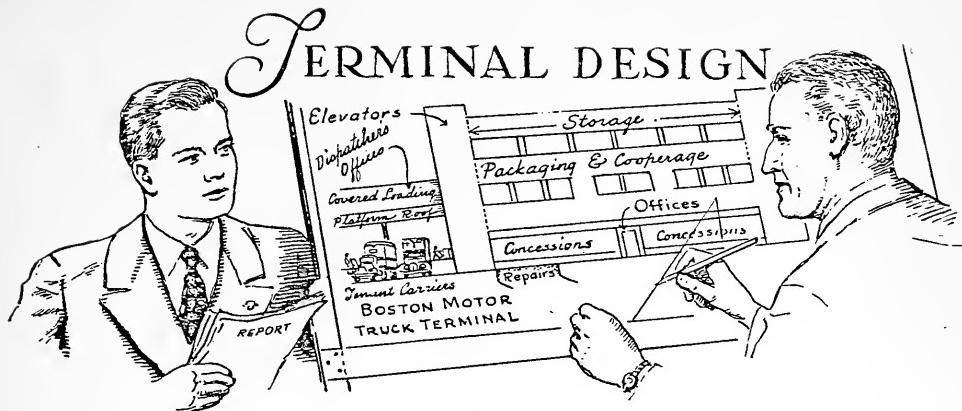


Fig. 6

Present Terminals In Boston Provide A Very Limited Service.  
Modernization, Expansion And Relocation Are Needed.  
Courtesy, The Boston Herald



Based upon a rational deduction and the proposals for terminals at New York and Louisville, it appears that a terminal to handle 2,800 tons daily should include or require the following:

A site of at least 9 acres.

An administration and storage building with a floor area of approximately 90,000 sq. ft.

A platform, or platforms, totalling 1,250 ft. in length, with back-up spaces for 200 trucks, and equipped with mechanical conveyor system.

Access roadways and parking areas.

A cost, including site, of at least \$2,500,000.

The administration building might provide offices for tenant carriers, storage warehouse space, cooperage and repair facilities, restaurant and rest rooms, etc. A gasoline station and motor repair shop, and even helicopter landing space could be optional features of the design.

Through the courtesy of the Port of New York Authority, a perspective drawing of one of their proposed terminals is

THE PORT OF NEW YORK AUTHORITY'S  
UNION TERMINAL FREIGHT STATION NO 2  
(UNION MOTOR TRUCK TERMINAL)

LOCATION —

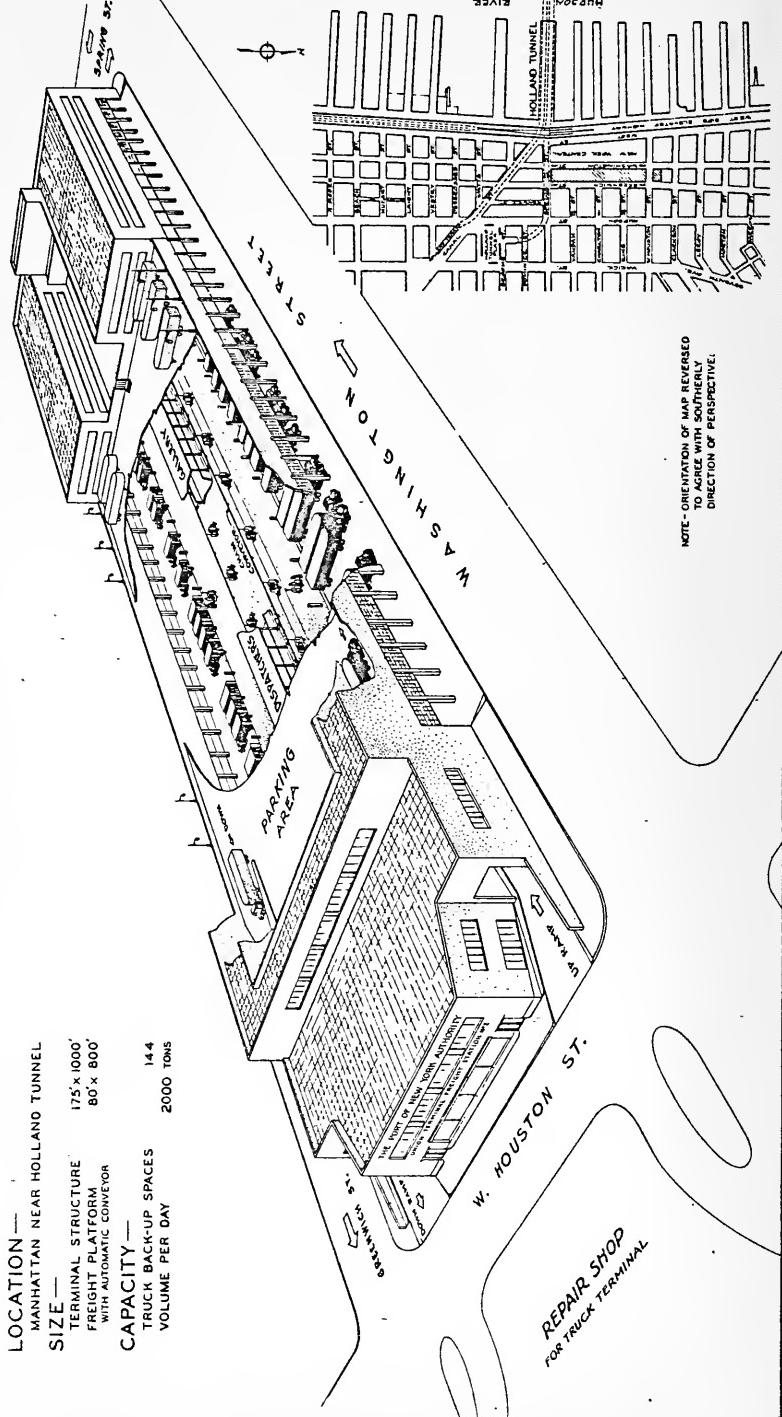
MANHATTAN NEAR HOLLAND TUNNEL

SIZE —

TERMINAL STRUCTURE: 175' x 1000'  
FREIGHT PLATFORM: 80' x 800'  
WITH AUTOMATIC CONVEYOR

CAPACITY —

TRUCK BACK-UP SPACES 144  
VOLUME PER DAY 2000 TONS



shown as Fig. 7. The estimated cost of a Boston Terminal, \$2,500,000 is based upon a similar structure with the exception that the freight platform is not within a completely enclosed building, but is merely roofed.

The actual details of design constitute, of course, an architectural problem and are attendant upon further basic information relative to daily capacity and possible number of tenant carriers.

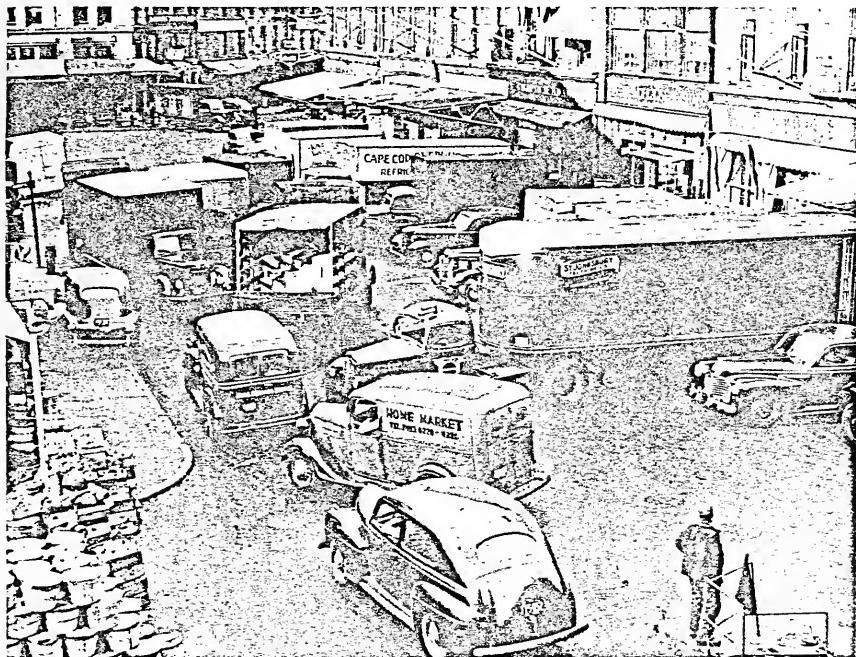
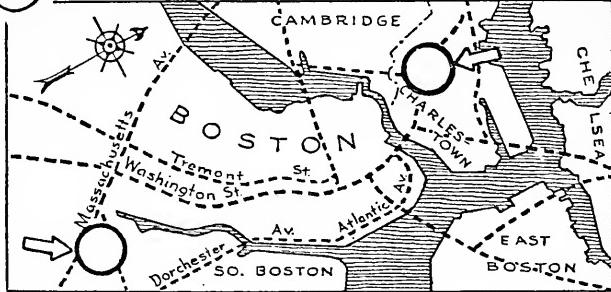


Fig. 8

A Union Terminal Is Designed To Reduce The Use Of  
Semi-trailers In Pickup And Delivery  
Courtesy, The Boston Herald

# TERMINAL LOCATION



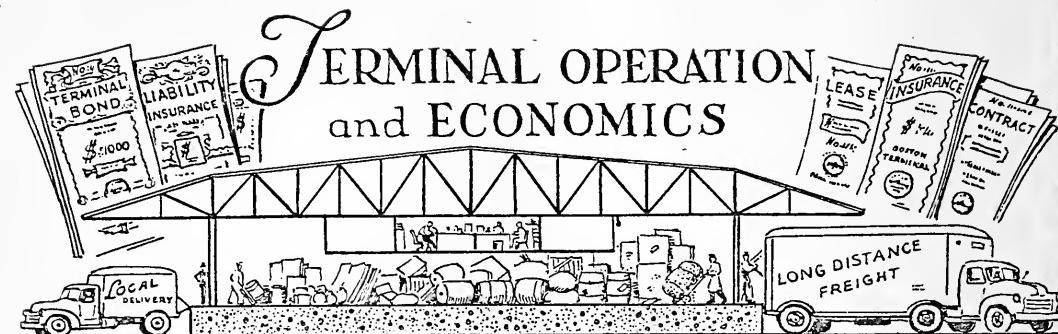
Ideally, downtown Boston should be served by a single terminal, centrally located with reference to the area to be served and the volumes of freight to be picked up and delivered. Such a location might be somewhere between the North and South Railroad Terminals and at or near the waterfront.

There are, however, other considerations in selecting the location of a terminal, and these may be important enough to outweigh the advantages of centrality. Accessibility to major arterial routes, cheapness, and proper relationship to other land uses are necessary qualifications which cannot be ignored. The Planning Board believes that an adequate downtown site would be hard to get, expensive, and would further complicate the traffic situation by encouraging the largest of trucks to enter the central business district.

The logical alternative is a location close to, but outside of the downtown area, and on the best possible arterial approaches. This idea, coupled with the geography of Boston,

leads to a conclusion that there should be at least two terminals, one to the north, the other to the south of the downtown area. In the north the Charlestown district in the vicinity of Rutherford Avenue seems to afford the best possibilities; in the south the filled-in area of the old South Bay at Southampton Street seems a likely location.

If the final decision should be for two terminals the question of their relative sizes would arise. A northern terminal would naturally be patronized by carriers serving communities reached by highways approaching Boston from the north and northwest, a southern terminal by carriers using highways leading to the south and southwest. An investigation, making use of the questionnaires and confined to the truckmen using the present General Express Exchange offices, shows that southern carriers move twice as much freight as those to the north. While this points to the conclusion that a southern terminal should be larger than a northern one, the Planning Board does not presume to specify their relative sizes with any degree of accuracy and recommends that actual design be attempted only after suitable research.



The benefits of union terminals are fairly obvious, yet private business has failed up to now to undertake such projects. The chief reason seems to be that, under the conditions usually applicable to business operations, the financial returns would be marginal. The necessity of paying full taxes, lack of power of eminent domain in acquiring sites, and higher interest rates on borrowed capital all are stumbling blocks in the path of a private solution of the terminal problem. It is improbable that private business can or will undertake such projects in the near future.

The Planning Board, therefore, is of the opinion that union terminals must be built as public projects. The least expensive way is for the City to use its borrowing power and to build these projects directly. The operation of the terminals, however, might well be carried on by a private operator under a lease granted by the City.

Whether publicly or privately operated, the method

should be something like this: the operator provides the labor at the platform, loading and unloading all trucks. Certain of the platform bays are rented to tenant carriers for their exclusive use, but a portion of the platform is reserved for the use of truckmen who are not tenants, or for the public at large. The area served by the terminal is divided into zones and pickup and delivery within each zone is carried on in the name of the terminal by local carriers under contract with the terminal authorities and its tenant truckmen. This is a service which the shippers are free to use or disregard, and in no manner restricts the freedom of other carriers to engage in pickup or delivery in the area served.

Revenues to the terminal operator are in the form of charges for freight handled, rental of bays at the platform, charges for pickup and delivery privilege under contract, and rental of office space and concessions, such as restaurant, sale of gasoline, etc.

In computing the cost of terminal operation it has been assumed that the City would be satisfied with sufficient revenue to meet the costs of interest on and amortization of its bonds, the costs of actual operation, and a sum in lieu of taxes equal to the tax revenue from the land only, at \$46 per \$1,000 of valuation. It has also been assumed that the City itself would operate the project and the pickup and delivery service. The items of cost in Table I are based, in the main, on existing unit costs of operation, with due allowance for the estimated increased efficiency of union terminal operation. These costs would not be substantially

TABLE I  
SUMMARY OF ANNUAL COSTS

A. FIXED COSTS:

1. Amortization + Interest, (Principal sum = \$2,500,000; interest rate = 1-3/4%; amortization period = 40 years.)	\$87,431
2. Taxes, (\$500,000 x .046)	<u>23,000</u> \$110,431

B. MAINTENANCE COSTS:

1. Heat, Light, Power, Water	\$21,168
2. Insurance	12,247
3. Building Service	79,800
4. Building Maintenance, (Contractual)	<u>21,000</u> \$134,215

C. OPERATIONS COSTS:

1. Platform Labor and Supervision	\$620,827
2. Cargo Insurance	9,072
3. Terminal Overhead Chargeable Directly To Handling Of Freight	<u>361,066</u> \$990,965
TOTALS, A + B + C	\$1,235,611

D. PICKUP AND DELIVERY COSTS:

TOTAL COST OF OPERATING TERMINAL AND P. & D.      \$1,126,613      \$2,362,224

Computation of all of the above costs is presented in detail at the end of this report, Appendix II.

different if the terminal were publicly built but privately operated.

The totals shown in the Table I indicate that if additional revenues from office rental, etc. are neglected, the City should find it possible to offer terminal handling services for \$1.47 per ton and pickup and delivery for \$1.93 per ton, compared with the present costs of \$1.74 and \$2.44 respectively. When added to the saving on freight interchanged between long-haul carriers at the platform, this represents a total annual benefit of \$800,000 to truckmen, shippers, and ultimately to the public at large.

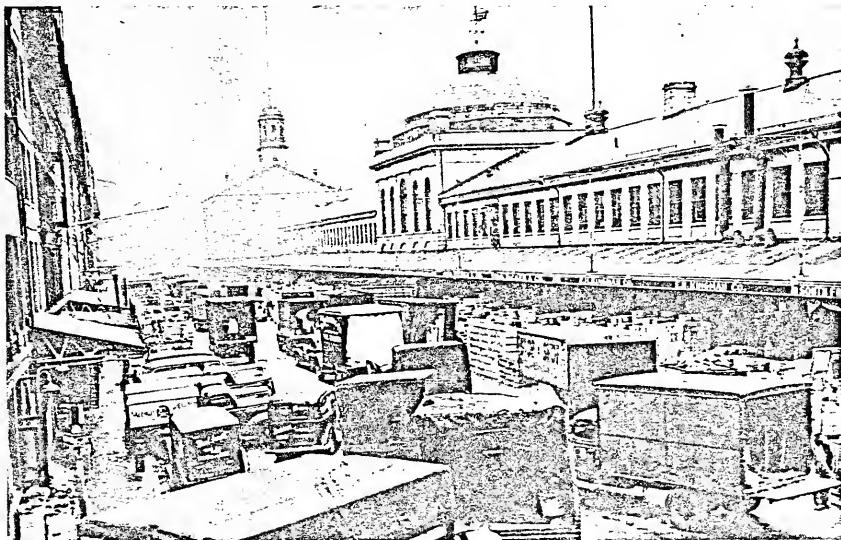
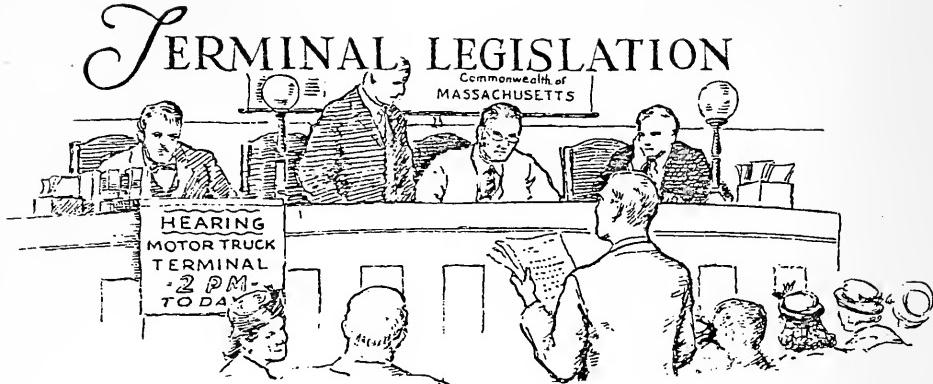


Fig. 9

More Trucking Confusion In The Market  
Photo By Fay Photo Service, Inc.



Terminal legislation, included in this report as Appendix I, embodies most of the ideas on terminal operation and economics contained in the preceding section.

The section of the bill relative to organization of the terminal commission provides for nominations by private agencies of candidates for three of the five memberships on the commission. This is a procedure for which there is precedent and which has been held constitutional.

The Planning Board believes that this bill contains proper safeguards both for the rightful interests of private business and those of the City, while at the same time granting to the terminal commission powers sufficiently broad to carry out successfully the duties imposed upon it.

Report On A Union Motor Truck Terminal  
For Boston

APPENDIX I

Preliminary Draft Of A Bill To Create A  
Boston Motor Truck Terminal Commission

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. For the purposes of providing a measure of relief from the problem of traffic in the city of Boston and of improving the competitive commercial position of the said city by facilitating the movement and handling of freight, there is hereby established the Boston Motor Truck Terminal Commission, hereinafter called the Commission, which shall consist of the Chairman of the Boston Traffic Commission ex officio and four other members appointed by the mayor of the city of Boston as follows: one member from two candidates to be nominated by the Boston Chamber of Commerce, one member from two candidates to be nominated by the Massachusetts Motor Truck Association, one member from two candidates to be nominated by the Boston Central Labor Union, and one member to be selected by the mayor. The four members first appointed shall, as designated by the mayor, continue in office for terms of two, three, four, and five years respectively from the effective date of this act. Immediately upon the expiration of the term of any member his successor shall take office and shall hold the same for a period of five years. A member appointed to fill a vacancy caused by reason other than the expiration of a term shall serve for the unexpired remainder of the term only. All appointive members shall be residents of or engaged in business in Boston.

The members of the Commission shall annually elect a chairman from their own number to serve for one year or until his successor is elected. Three members shall constitute a quorum and the vote of three members shall be necessary for any action taken by the Commission. No vacancy in the membership of the Commission shall impair the right of a quorum to exercise all the rights and perform all the duties of the Commission.

Members shall serve without compensation but shall be reimbursed for their actual expenses incurred in the performance of their duties in an amount not to exceed \_\_\_\_\_ dollars per year for each member.

The Commission may, subject to the approval of the mayor, appoint and remove a full-time paid director and, from time to time, fix his salary. The appointment, employment, or removal of the director shall not be subject to the provisions of Chapter 31 of the General Laws nor the rules made thereunder.

SECTION 2. As used in this act the following words and terms shall have the following meanings, unless the context shall indicate another or different meaning or intent:-

(a) The word "Commission" shall mean the Boston Motor Truck Terminal Commission established as provided in sections 1 and 12 of this act or, if said Commission shall be abolished, the board, body or commission succeeding to the principal functions thereof or to whom the powers given by this act to the Commission shall be given by law.

(b) The words "terminal project" or "terminal" shall mean all lands, buildings, platforms, mechanical equipment, tracks and rail sidings, and accessories, assembled on a single site and necessary or incidental to the loading and unloading, assembling, interchange, storage, crating or boxing, and repair of freight merchandise, or buildings or accessories necessary or incidental thereto on adjacent or nearby sites. Accessories may include facilities for the parking, storage, repair or servicing of motor trucks or other vehicles necessary to the operation of the terminal.

(c) The word "operation" shall mean the carrying on of the business of loading, unloading, assembling, handling, storage, crating or boxing of freight merchandise through the use of the terminal project(s). Terminal operation shall include all necessary or incidental overhead activity such as day-to-day maintenance and upkeep of the terminal project(s), clerical and other office services, telephone, heat and light, and insurance. The parking, storage, repair and servicing of motor trucks or other vehicles necessary to the operation of the terminal shall be included within the meaning of the term. Subject to the applicable regulations of the Department of Public Utilities terminal operation may include the operation of pickup and delivery service within the effective radius of the terminal project(s) as determined by economic feasibility.

(d) The word "rent" shall mean charges fixed by the Commission under such conditions as it may determine and as hereinafter provided for occupancy or use of office, platform, storage, parking, or other space, or services rendered, within or outside the confines of the terminal project(s).

SECTION 3. The Commission shall have and, subject to the approval of the mayor, shall exercise in the name of and on behalf of the City, all powers necessary and convenient to the accomplishment of the purposes of this act, including the power to:

(a) Construct, maintain, repair and operate, or lease for operation terminal projects. Such projects shall be confined to locations within the corporate limits of the city of Boston;

(b) Fix and revise, from time to time, rents and other charges producing income for the terminal project(s), when the said terminal project(s) are operated directly by the Commission;

(c) Employ, subject to appropriation, such technical, clerical and other assistants as may be necessary to the purposes of this act;

(d) Acquire by eminent domain under chapter seventy-nine or chapter eighty A of the General Laws or by purchase, gift, device, or otherwise, and to hold, lease, use and dispose of real and personal property, including such public or private lands other than public parks, playgrounds or other recreation areas, or parts thereof or rights therein, and public or private ways as the Commission may deem necessary for carrying out the provisions of this act;

(e) Adopt rules consistent with law for the regulation of its affairs and the conduct of its business.

SECTION 4. No contract for construction or work of any kind in connection with any terminal project, the estimated cost of which amounts to one thousand dollars or more, shall be awarded by the Commission unless proposals for the same shall have been invited by advertisement in at least one daily newspaper published in the city of Boston, once a week for at least two consecutive weeks, the last publication to be at least seven days before the time specified for the opening of the said proposals, and then only to the lowest responsible bidder as determined by the Commission. Such advertisements shall state the time and place where plans and specifications of proposed construction or work may be had and the time and place for opening the proposals in answer to the said advertisements, and shall reserve to the Commission the right to reject any or all proposals. All such proposals shall be opened in public. No bill or contract shall be split or divided for the purpose of evading any provision of this section. All contracts made by the Commission hereunder where the amount involved is one thousand dollars or more shall be in writing. Any contract made as aforesaid may be required to be accompanied by a bond with sureties satisfactory to the Commission, or by a deposit of money, certified check or other security for the faithful performance thereof, and such bonds or other security shall be deposited with the city treasurer until the contract has been carried out in all respects; and no such contract shall be altered except by written agreement of the contractor, the sureties on his bond and the Commission. Any amounts received as a result of the failure of faithful performance required in any contract hereunder shall be credited to the general funds of the City.

SECTION 5. The Commission shall, as soon as each terminal project is completed for use under this act, proceed to operate the same or, at its option, lease the same or any portion thereof for operation. Any such lease for terminal operation shall be made after inviting proposals for the operation of the terminal project or part thereof by advertisements in at least one daily newspaper published in the city of Boston, once a week for at least two consecutive weeks, the last publication to be at least seven days before the time specified for the opening of the said proposals.

Such advertisements shall state the time and place where the form of lease may be had and the time and place for opening the proposals in answer to said advertisements, and shall reserve to the Commission the right to reject any or all proposals. All such proposals shall be opened in public. No lease shall be made except to the highest responsible bidder as determined by the Commission. Every lease shall be accompanied by a bond with sureties satisfactory to the Commission, or by a deposit of money, certified check or other security for the faithful performance thereof, and such bond or other security shall be deposited with the city treasurer until the lease has been carried out in all respects. All amounts received from leases under this act or as a result of the failure of faithful performance required in any such lease shall be credited as general funds of the City and may be appropriated for any municipal purposes. No person shall be assessed any tax upon any real estate or buildings of which he is the lessee hereunder, any provision of general or special law to the contrary notwithstanding.

Any lease may, at the discretion of the Commission, contain a schedule of maximum rates to be charged by the lessee for the services to be rendered or the facilities to be used. Such services and rates shall be subject to regulation by the Department of Public Utilities in such manner and to such extent as may be provided by law. No lease made hereunder shall be for a period of more than \_\_\_\_\_ years.

SECTION 6. Any plan of operation, whether directly by the Commission or by a lessee, shall provide for access to the terminal facilities by the public on a basis of equality, so far as is practicable. While the rental of specified spaces at the terminal platform(s) or of other of the terminal facilities may require the use of such facilities to be restricted, sufficient and reasonable access, within the limits of practicability, to similar accommodations shall at all times be reserved to the public at large under such terms and regulations as the Commission may deem proper.

SECTION 7. For the purposes of this act the City may from time to time incur debt and issue bonds or notes to an amount not exceeding, in the aggregate, \_\_\_\_\_ dollars. Debt may be incurred under this act only upon authorization by a two-thirds vote of the city council, approved by the mayor in accordance with the city charter. The city treasurer, when so authorized, may borrow money and issue and sell at public or private sale serial bonds or notes, registered or with interest coupons attached, as the treasurer may deem best. Such bonds or notes shall bear on their face the words "City of Boston, Terminal Projects Loan, Act of 1948." Each authorized issue shall constitute a separate loan, and such loans shall be paid in not more than forty years from their dates. Debt incurred from time to time under this act shall not be included in determining the limit of indebtedness of the City as established by law, but shall, except

as herein provided, be subject to the provisions, applicable to the City, of chapter forty four of the General Laws, exclusive of the limitation contained in the first paragraph of section seven thereof. Said City may issue temporary notes of the City payable in not more than one year from their dates, in anticipation of the issue of serial bonds or notes authorized by this section, but the time within which such serial bonds or notes shall become due and payable shall not, by reason of such temporary notes, be extended beyond the time fixed by this section. All notes issued in anticipation of the issue of such serial bonds or notes shall be paid from the proceeds thereof.

SECTION 8. The public improvements authorized in this act are herein declared to be general in their benefits and no betterments shall be assessed therefor.

SECTION 9. Property acquired or used for the purposes of this act, whether or not leased, shall be deemed to be held by the City in its governmental capacity; and the City shall not be liable for any injury, loss or damage suffered by any person or property on or about any property so acquired or used.

SECTION 10. If any provision of this act, or the application of such provision to any person or circumstances, shall be held invalid, the remainder of this act, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.

SECTION 11. All other general or special laws, or parts thereof, inconsistent herewith are hereby declared to be inapplicable to the provisions of this act.

SECTION 12. This act shall take full effect immediately upon its acceptance by vote of the city council of the city of Boston, subject to the provisions of the charter of the said city.

Report On A Union Motor Truck Terminal  
For Boston

APPENDIX II

Computation Of Reduction In Traffic And Costs Of Operation

1. Scope of the Survey.

The basic figure employed in these computations is the number of tons of L.T.L. freight in consignments of 3 tons or less which are now being picked up or delivered daily in downtown Boston. This information could be obtained only through the truckmen by questionnaire. It was realized that the questionnaire would probably be answered by a minority of the firms contacted and that the data would thus be incomplete. However, if a complete inventory of trucking firms, number of trucks and total tonnage capacity was available it might serve as a base to which sample information might be applied proportionally, and thus yield an estimate of the total freight tonnage.

The first step was to decide what type of trucking firms are engaged in the kind of activity for which a union terminal is intended. A union terminal in Boston would have one main purpose: to render more efficient the pickup and delivery of general, L.T.L. freight in small consignments. There are three types of common carriers who are most assuredly engaged in that kind of business. They are:

A. Those located in downtown Boston but not working through the General Express Offices and not having a private terminal of their own. Mostly small, their chief occupation seems to be local pickup and delivery work.

B. Those working through the General Express Terminals in downtown Boston and serving mostly the surrounding cities and towns as far out as 100 miles. Their home offices are usually in the communities which they serve and communication with downtown Boston is only part of their business.

C. Truckmen located in the metropolitan area who, judging by their size, are engaged in more than merely local activity. These are the "over-the-road" carriers, so-called, handlers of general trucking freight as contrasted with furniture movers and other specialists. Most are listed in the Motor Express Directory as having private terminals and serving specific territories, often at some distance from Boston and out-of-State.

These are the types of truckmen who, most probably, would patronize a union terminal. Goods moved by the privately-owned fleets of shippers and carriers under special contract may not be considered as certain to move through a terminal.

A complete list of truckmen of the "A", "B", and "C" types, together with number of trucks and total rated capacity in tons for each firm, has been assembled from the files of the Massachusetts Department of Public Utilities. This list is summarized as follows:

<u>Group</u>	<u>No. of Firms</u>	<u>No. of Trucks</u>	<u>Rated Capacity in Tons</u>
"A"	168	654	3,034
"B"	333	1,886	12,777
"C"	195	5,167	55,557

The "B" and "C" groups include many tractors for which an average trailer capacity of 15 tons has been allowed. These complete figures for the three groups provide the base to which sample information relative to trucks and freight tonnage can be applied.

The membership list of the Massachusetts Motor Truck Association may be regarded as a fairly good cross-section of truck owners in this state. A questionnaire (see Fig. 4) was sent to every 5th name on the list, making 242 such letters. To these were added 188 others from the list of "A", "B", and "C" truckmen. Thus a total of 430 questionnaires were sent out, 267 of which went to "A", "B", or "C" firms and 163 to unclassified truckmen.

Replies were received from 150 firms, 35% of those contacted. These give a sample which covers:

10% of the firms and 22% of the trucks in the "A" group,  
13.5% of the firms and 23% of the trucks in the "B" group,  
23.5% of the firms and 29% of the trucks in the "C" group,

and, in the aggregate, the sample covers 27% of all the trucks in the "A", "B", and "C" groups.

It is interesting to ascertain how much of all pick-up and delivery in Boston (exclusive of that done sporadically by so-called "gypsies", who present an imponderable problem) is carried on by the "A", "B", and "C" types. These classified firms comprise about one-third of all truck owners in Massachusetts who are members of the Massachusetts Motor Truck Association. This fact and the replies to the questionnaire have made it possible to calculate that on the basis of a small sample, 50% of all truckmen engaged in P. and D. in downtown Boston are of the "A", "B", or "C" types, representing 66% of all trucks so engaged and 70% of all L.T.L. tonnage involved, in consignments of 3 tons or less.

According to our replies an average day finds 71% of all the trucks in the "A" group engaged in pickup and delivery work in downtown Boston, a fact which seems to bear out our definition of this group. The corresponding figures for "B" and "C" are 31% and 19% respectively, which appear reasonable. Calculations by direct proportions for each type of trucking yield the following conclusions as to total number of trucks engaged in pickup and delivery in downtown Boston on an average day:

Group "A", 467 trucks,  
Group "B", 576 trucks,  
Group "C", 977 trucks,

for a grand total of 2,000 trucks, in round figures.

It is unfortunate that no figures for mileage on the downtown streets were sought in the questionnaire. By a previous inquiry, directed to the General Express Offices, it is indicated that 15 miles per truck per day is a conservative estimate. If this figure is used we may conclude that our three types of trucking generate 30,000 truck-miles per day in downtown Boston. A check on this figure can be obtained by employing statistical data assembled by the New England Motor Rate Bureau. According to the Bureau, 450 lbs. of freight, on the average, are picked up or delivered in the Boston area for each mile driven. At that rate 32,000 truck-miles would be required for the total tonnage calculated on the basis of the replies received. Similar calculations indicate that these trucks make a total of somewhere between 28,000 and 38,000 stops daily for pickup and delivery in downtown Boston.

The most important information in the questionnaire is the number of tons picked up, delivered, and interchanged. The totals for each group are calculated from the answers to the questionnaire and the total truck capacities for the group, as ascertained from the files of the Department of Public Utilities. These totals are as follows:

<u>Group</u>	<u>Pickup and Delivery Tonnage</u>	<u>Interchange Tonnage</u>
"A"	1,180	338
"B"	1,994	982
"C"	4,027	1,020

It is not known how much of the interchange tonnage is already included in the pickup and delivery tonnage, hence, in the financial calculations later on it is assumed to be one-half.

A statistical summary based on the questionnaire and Mass. Department of Public Utilities information is presented as Table II.

TABLE II

City Planning Board  
Boston, Mass.

UNION MOTOR TRUCK TERMINAL STUDY

SUMMARY OF STATISTICS BASED ON QUESTIONNAIRE SENT TO TRUCKMEN

	Type Of Trucking Business			Totals, A+B+C	Un- classi- fied
	A*	B*	C*		
No. of Firms to Whom Questionnaires Were Sent	42	117	110	269	163
No. of Replies Received	17	45	46	108	42
Total No. of Carriers in This Class, As Per Records of Mass. Dept. of Public Utilities	168	333	195	696	?
<u>TOTALS FOR REPLIES RECEIVED</u>					
Q.#1. No. of Own Trucks Engaged in P. & D. in Downtown Boston, On An Average Day	105	133	279	517	60
Q.#2. No. of Trucks of Others Calling at Terminal Daily For P. & D. in Downtown Boston	6	673	201	880	142
Q.#3. Average No. of Stops Per Truck on P. & D. in Downtown Boston, On An Average Day	16	27	16	21	17
Q.#4. No. of Tons of P. & D. Freight in Downtown Boston, On An Average Day	314	536	1,181	2,031	210
Q.#5. No. of Tons of Freight Interchanged, On An Average Day	90	264	299	653	136
Total No. of Trucks in This Class, As Per Records of the Mass. Dept. of Public Utilities	654	1,886	5,167	7,707	?
Total Rated Capacity in Tons, By Classes, As Per Records of the Mass. Dept. of Public Utilities	3,034	12,777	55,557	71,368	?
<u>CALCULATED GRAND TOTALS FOR ALL CARRIERS, BY CLASSES</u>					
Q.#1. No. of Own Trucks Engaged in P. & D. in Downtown Boston, On An Average Day	467	576	977	2,020	?
Q.#2. Not Calculated					
Q.#3. Total No. of Stops For P. & D. in Downtown Boston, On An Average Day	7,476	15,549	15,624	38,649	?
Q.#4. Total No. of Tons of P. & D. Freight in Downtown Boston, On An Average Day	1,180	1,994	4,027	7,201	?
Q.#5. Total Tons of Freight Interchanged Daily	338	982	1,020	2,340	?

\*A. Local Pickup and Delivery Truckmen Located in Downtown Boston.

\*B. Carriers Working Through General Express Offices Located in Boston.

\*C. "Over-the-road" Carriers Having Private Terminals in Metropolitan Area.

## 2. Estimated Benefits To Traffic.

The first step in calculating the benefits which a union terminal might bring is to estimate how many tons of freight would be handled at the terminal platform. There is no past experience which is helpful in making this estimate and the best we can do is to make a conservative guess, as follows:

50% of the tonnage now handled by group "A" = 590 tons,  
50% of the tonnage now handled by group "B" = 1,000 tons,  
25% of the tonnage now handled by group "C" = 1,000 tons,

which, in round figures, gives 2,600 tons of freight to be picked up or delivered daily in downtown Boston. The firms who handle that much tonnage would, by similar proportions, interchange about 400 tons daily, one with another. If half of this is considered as already included in the pickup and delivery figure, our final conclusion is that a union terminal might handle 2,800 tons at the platform daily, of which 2,400 tons would be picked up or delivered in the downtown area.

According to the New England Motor Rate Bureau, a pickup and delivery truck spends 3.64 hours in loading and unloading and 4.36 hours in running time on the streets, for a total of 8 hours daily. Each truck picks up or delivers an average of 0.8575 ton for each hour of operation, 6.86 tons each day. The Bureau also estimates that at present one mile of travel is required for each 0.225 ton handled. It is easily calculated, therefore, that to handle 2,800 tons of freight requires 408 truck-days and 12,444 truck-miles, by present methods.

With a union terminal in operation the tonnage which must be hauled over the streets could be diminished by the number of tons interchanged, i.e., from 2,800 to 2,400. Aside from that, there are three other advantages which would make possible a reduction in traffic:

1. A union terminal permits the consolidation of loads. As previously mentioned, the present average load factor in Boston is 0.44 (sometimes referred to as 44%). The Port of New York Authority claims that load factors in excess of 0.90 would be possible with union terminal operation. For our computations we assume a load factor increase from 0.44 to 0.88.

2. Besides making it possible for each truck to handle a greater load, consolidation would reduce route mileage. At present each truck travels an average of 30.5 miles in an eight hour day of pickup and delivery work. This is principally because consignments handled by a single truck are collected at or headed for scattered points. With a union terminal in operation the area served could be divided into small zones and the necessary mileage restricted to little more than the travel distance between the terminal and such zones.

3. At present the places of business of carriers are scattered (see map of private terminals and express offices, Fig. 3), with some of them at considerable distance from downtown Boston. It is believed that a union terminal could be located so as to be nearer the downtown area than the average of existing terminals. A further saving in mileage would thus be possible.

If 5-ton trucks are employed and the load factor is 0.88, then on a single operation a truck could pick up or deliver  $5 \times 0.88 = 4.4$  tons (8,800 lbs.). At the present rate of 3,775 lbs. loaded and unloaded per hour, two complete pickup and delivery operations comprising 8.8 tons could easily be carried through in a day. This would necessitate  $17,600/3,775 = 4.66$  hours for loading and unloading, leaving 3.34 hours for running time. At the present time trucks cover approximately 7 miles per running-time-hour, and at that same rate could cover  $3.34 \times 7 = 23.38$  miles daily in the future.

The moving of 2,400 tons daily would require 2,400/  
 $8.8 = 273$  trucks.  $273 \text{ trucks} \times 23.4 \text{ miles} = 6,388 \text{ truck-miles}$ .  
Trucking necessary for the volume of freight estimated to be handled through a union terminal would thus be reduced from 12,444 truck-miles to 6,388 truck-miles, a reduction of nearly 50%. That volume of freight represents only 36% of the total for the "A", "B", and "C" types of carriers which, in turn, is 70% of all P. and D. tonnage in downtown Boston. The estimated reduction in truck traffic occasioned by pickup and delivery is, therefore,  $0.50 \times 36 \times 0.70 = 12.6\%$ .

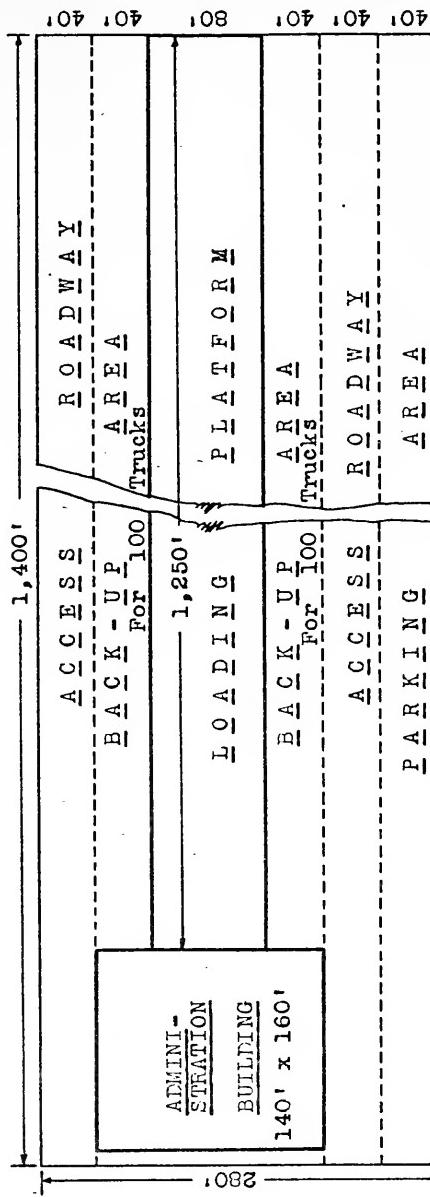
### 3. Estimated Financial Benefits.

In order to develop a discussion of the economic considerations it is necessary first to arrive at a quantitative estimate of the essential elements in the design of a terminal project, for purposes of estimating the cost. A purely diagrammatic sketch of a terminal to handle 2,800 tons daily is shown as Fig. 10 and the basic data upon which the platform length and site area are figured is developed below. Such a terminal would consist of an administration building at least 140' x 160' or equivalent, and a platform or platforms totalling 1,250 ft. in length. Back-up spaces for 200 trucks, mechanical conveyor equipment, access roadways and parking areas would also be provided. This would call for a minimum site of 9 acres and the total cost would be at least \$2,500,000.

#### Calculation of Site Area and Platform Length

$\frac{2,400 \text{ tons of P. \& D. daily}}{8.8 \text{ tons per truck, daily}} = 273 \text{ P. \& D. trucks required.}$

Loading and unloading time per day = 4.66 hours. If it is assumed that approximately 1/2 of this time is spent at the terminal



CITY Planning Board  
Boston, Mass.  
Union Motor Truck Terminal Study  
DIAGRAMMATIC LAYOUT OF TERMINAL TO  
HANDLE 2,800 TONS DAILY  
Scale: 1" = 100' October, 1947.

Fig. 10

platform, then

$$(2.33/8) \times 273 = 80 \text{ spaces are required for P. \& D. trucks.}$$

If semi-trailers carry an average load of 15 tons, 2,800 tons would require 187 loadings or unloadings. At 4 tons per hour, 15/4 hours would be required per truck, and

$$\frac{15/4}{8} \times 187 = 88 \text{ spaces are necessary for semi-trailers.}$$

Total spaces required =  $80 + 88 = 168$ . This is the theoretical minimum and would require perfect timing. Such coordination is probably not within the realm of practical possibility, so suggest 200 spaces as the desirable minimum.

200 spaces @ 12.5 ft. per space = 2,500 ft. of platform space. Platform length = 1,250 ft. To allow for an administration building at the end of the platform the simplest design of a terminal would require a site 1,400 ft. long. The minimum width should be 280 ft. to allow for an 80 ft. wide platform, two 40 ft. back-up spaces, two 40 ft. roadways, and a 40 ft. parking area.

$$\text{Overall area} = 1,400 \times 280 = 392,000 \text{ sq. ft.} = 9 \text{ acres.}$$

Estimate Of Cost Of The Terminal (Round Figures)

$$\text{Platform Area} = 1,250' \times 80' = 100,000 \text{ sq. ft.}$$

$$\text{Building Volume} = 140' \times 160' \times 40' = 896,000 \text{ cu. ft.}$$

$$\text{Road Area} = \frac{1,400' \times 2 \times 40'}{9} = 12,440 \text{ sq. yds.}$$

$$\text{Back-up Areas} = \frac{1,250' \times 2 \times 40'}{9} = 11,000 \text{ sq. yds.}$$

$$\text{Platform Gallery} = 1,250' \times 7' \times 24' = 210,000 \text{ cu. ft.}$$

$$\text{Building Cost} = 896,000 \text{ cu. ft.} @ \$1 = \$896,000$$

$$\text{Platform Cost} = 100,000 \text{ sq. ft.} @ \$5 = 500,000$$

$$\text{Road Cost} = 12,440 \text{ sq. yds.} @ \$4 = 50,000$$

$$\text{Back-up Area Pavement} = 11,000 \text{ sq. yds.} @ \$4 = 44,000$$

$$\text{Gallery Cost} = 210,000 \text{ cu. ft.} @ \$0.40 = 84,000$$

$$\text{Parking Area} = 20,000$$

$$\$1,594,000$$

$$\text{Add 25\% for equipment, engineering, etc.} \quad 398,000$$

$$\$1,992,000$$

$$\text{Cost of Site} = 9 \times 43,560 \times \$1.25 \quad 490,000$$

$$\$2,482,000$$

Total Cost is, therefore, approximately \$2,500,000.

Annual Costs Of Operation

The general costs of operating a union terminal may be considered as comprising three categories, viz., fixed costs, maintenance costs, and operations costs. A fourth element in the picture and which may be regarded either as part of the terminal operation or as an independent category is the cost of pickup and delivery service. In computing these costs the following basic data and assumptions have been employed:

A. Fixed Charges:

1. A site (or sites) of 9 acres might be purchased for \$1.25 per sq. ft., about \$500,000 in all.
2. Cost of construction and equipment will be about \$2,000,000.
3. Interest on capital load is at 1-3/4%, if the venture is undertaken as a public project and the loan is raised through serial bonds backed by the credit of the City.
4. Complete amortization of capital investment in land, buildings and equipment is achieved in 40 years.
5. A constant annual payment each year for 40 years covers both principal and interest charges.
6. Profit to the City from the terminal projects will be limited to an amount equivalent to the tax yield at the rate of \$46 per thousand of valuation of the land only, at the time of taking.

B. Maintenance Costs:

1. Heat, light, power, and water costs are taken as \$.00140 per cwt. of freight handled. This is the average of present costs for the same services, as compiled by the New England Motor Rate Bureau.
2. Building insurance of various kinds is estimated to cost \$.00081 for each cwt. of freight handled, N. E. Motor Rate Bureau average.
3. Building service will be rendered by a full-time staff of employees, at an estimated annual cost of \$79,800.
4. Building maintenance by contract is estimated to amount to \$21,000 annually.

C. Operations Costs:

1. Platform labor at a modern union terminal could handle freight at the rate of 3,000 lbs. per man-hour.

2. Compensation for platform labor, including workmen's compensation and social security taxes, is at the present rate of \$1.2167 per hour, N. E. Motor Rate Bureau figure. This deduces to \$.04056 per cwt. Platform supervision comes to \$.00050 per cwt., total cost at the platform = \$.04056 + \$.00050 = \$.04106 per cwt.

3. Cargo insurance = \$.0006 per cwt., N. E. Motor Rate Bureau figure.

4. Terminal overhead expense chargeable to handling is as follows, (N. E. Motor Rate Bureau statistics):

Billing and Collecting	\$.01850	per cwt.
Supplies and Expense	.00236	" "
Management	.00097	" "
Other	.00205	" "
Total	\$.02388	" "

D. Pickup and Delivery Costs:

Estimates of pickup and delivery costs with a union terminal in operation are based on the assumption that through consolidation of loads the load factor can be increased from the present 0.44 to a future 0.88. A 5-ton truck making two trips daily would pick up and/or deliver  $2 \times 5 \times 0.88 = 8.8$  tons daily, i.e., 17,600 lbs. Since loading and unloading consumes time at the rate of 3,775 lbs. per hour, then  $17,600/3,775 = 4.66$  hours are required for these operations. This would leave 3.34 hours for running time. At the present rate of 6.98 miles per running-time-hour a truck would cover  $6.98 \times 3.34 = 23.3$  miles daily.

The daily cost per truck of conducting pickup and delivery operations, itemized below, is calculated to be \$1.6899 for each hour of operation and \$.0764 for each mile. The cost per truck for 8 hours and 23.3 miles is as follows:  $8 \times \$1.6899 + 23.3 \times \$.0764 = \$15.2993$ . P. & D. cost per cwt. =  $\$15.2993/176 = \$.08693$ ; cost per ton = \$1.74.

Daily Cost Per Truck Of Conducting  
Pickup And Delivery Operations

<u>ITEMS</u>	<u>Cost Per Hr.</u>	<u>Cost Per Mi.</u>
Gasoline, incl. taxes	\$ .0265	
Oil, incl. taxes	.0018	
Servicing	.0009	
Repairs	.0326	
Shop Overhead	.0011	
Tires and Tubes	.0135	
Depreciation	\$ .1800	
Auto Insurance	.1265	
Taxes and Licenses	.0360	
Wages	1.0560	
Compensation Insurance	.0414	
Social Security Taxes	.0178	
Overhead:		
Supervision of Transportation	.0037	
Other Transportation Expenses	.0081	
Salaries & Expenses, Insurance & Safety	.0003	
Workmen's Compensation Insurance	.0007	
Cargo Insurance	.0090	
Fire & Theft Insurance	.0003	
Other Insurance	.0015	
Salaries, General Offices	.0628	
Expenses, " "	.0134	
Salaries, General Office Employees	.0384	
Expenses, " " "	.0065	
Legal Expense	.0132	
General Office Supplies	.0192	
Communication Service	.0165	
Outside Auditing	.0017	
Employees' Welfare	.0005	
Purchasing and Stores	.0011	
Other General	.0076	
Uncollectible Revenues	.0007	
Social Security Taxes	.0052	
<u>TOTALS, Per Truck</u>	<u>\$1.6899</u>	<u>\$0.0764</u>

A summary of the annual costs of terminal operation is shown as Table I. If the \$990,965 of Operations Costs (C) is regarded as net cost of handling and the \$1,126,613 in item (D) is taken as net cost of pickup and delivery, and the cost of general terminal overhead (A + B) is divided evenly between handling and P. & D., the gross cost of handling becomes

$$\$990,965 + \frac{\$110,431 + \$134,215}{2} = \$1,113,288$$

and gross cost of pickup and delivery becomes

$$\$1,126,613 + \frac{\$110,431 + \$134,215}{2} = \$1,248,936.$$

The necessary charge by the terminal operator to the terminal patrons to cover gross cost of handling is

$$\frac{\$1,113,288}{2,800 \times 270} = \$1.47 \text{ per ton,}$$

and charge necessary to meet gross cost of P. & D. is

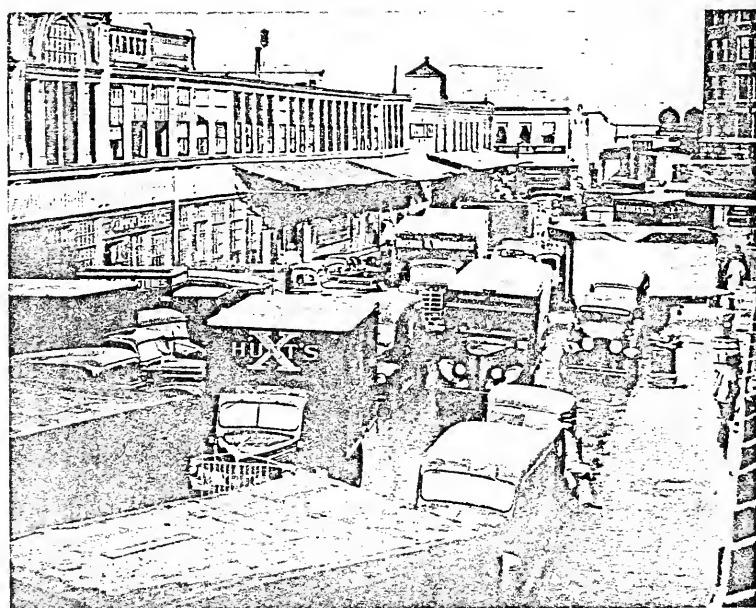
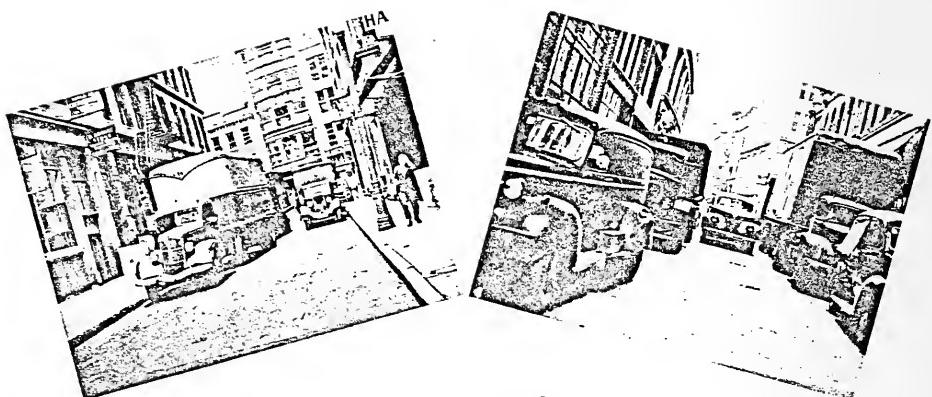
$$\frac{\$1,248,936}{2,400 \times 270} = \$1.93 \text{ per ton,}$$

(270 being the number of full working days in a year).

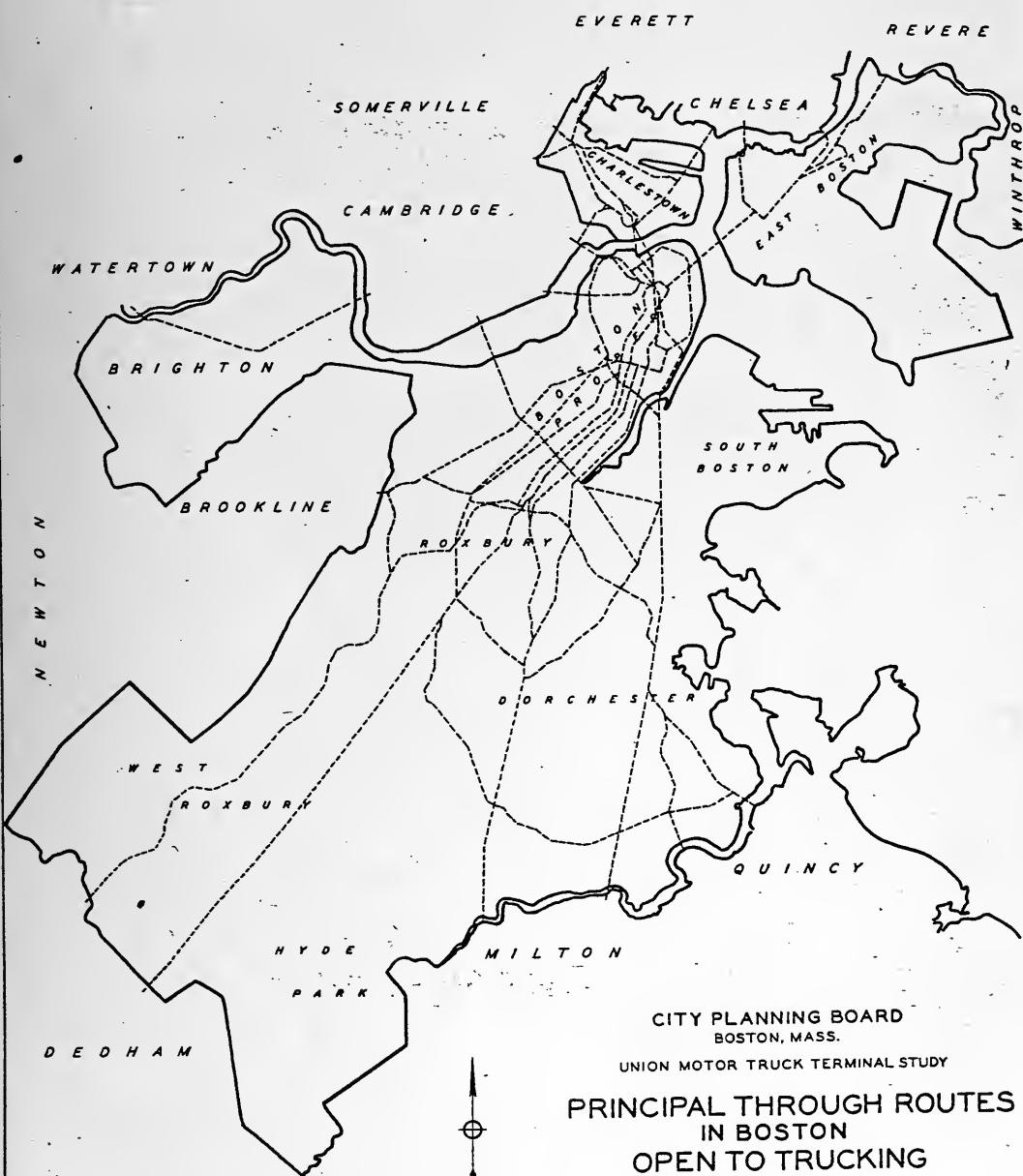
It is thus estimated that all expenses of operating the terminal plus pickup and delivery service could be met by levies of \$1.47 per ton for handling and \$1.93 per ton for P. & D. These services cost at present \$1.74 per ton and \$2.44 per ton respectively. The estimated savings are, therefore, 27 cents per ton on handling and 51 cents per ton on pickup and delivery, amounting to \$204,120 and \$330,480 annually. To these savings should be added the present cost of pickup and delivery on the 400 tons daily of freight interchanged between carriers, freight which in a union terminal need move merely along the platform instead of over the streets. This saving would amount to

$$400 \times 270 \times \$2.44 = \$263,520 \text{ annually.}$$

A union terminal as proposed would, therefore, make possible a total annual saving of \$798,120 to truckmen, shippers and consignees, and eventually to the public at large.



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CITY PLANNING BOARD  
BOSTON, MASS.  
UNION MOTOR TRUCK TERMINAL STUDY  
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IN BOSTON  
OPEN TO TRUCKING**

SCALE IN MILES

OCTOBER, 1947.

